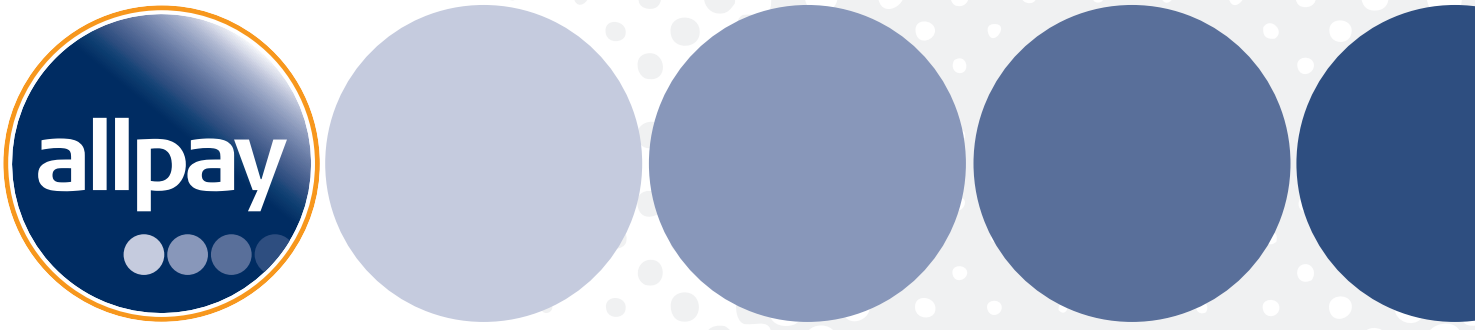

Broadband Technical Information

How allpay Broadband works...

...it is very simple

Using a wireless link, we are able to offer communities a fast and reliable broadband service.

This wireless link is transmitted through local access points and is received through a subscriber module. Compact in design, a subscriber module can be easily fixed to the roof of a house or business, with no disruption, allowing you instant access to the internet.

Once an access point has been positioned in a community, it provides homes and businesses with a reliable connection to the internet with speeds of up to 35Mb.

For more detailed information about our allpay Broadband equipment please read on.

All technical information has been provided by Motorola, the company that supplies us with our wireless broadband equipment.

1

allpay transmits signals from a location in Herefordshire to a network of access points.

2

Access points can be located at churches, public buildings or on private land. Access points act as relay stations for the signal.

3

Signals from these access points are received by our subscriber modules at our customers' homes or businesses.

Point-to-Point 54300 & Point-to-Point 58300

allpay Broadband uses Motorola Point-to-Point (PTP) Wireless Ethernet Bridges at access point locations to send and receive wireless radio signals between sites. If an access point is used to relay the signal to another access point an additional PTP Wireless Ethernet Bridge is required.

allpay Broadband uses PTP equipment on the licence exempt bands 5.4 and 5.8 GHz.

The Motorola Point-to-Point (PTP) technology is designed to reliably transport communications in any environment including non-line-of-sight (NLOS), line-of-sight (LOS) and in high interference environments, as well as over water.

Access Points

PTP 300 Integrated

PTP 300 Connectorized

RADIO TECHNOLOGY	REMARKS
RF band	5.725 GHz–5.875 GHz[1] 5.470 GHz–5.725 GHz[1]
Channel size	Configurable to 5, 10 or 15 MHz
Channel selection	By *intelligent* Dynamic Frequency Selection (*i*-DFS) or manual intervention; automatic selection on start-up and continual adaptation to avoid interference
Transmit power	Varies with modulation mode and settings from -18 dBm to 27 dBm
System gain	Integrated: Varies with modulation mode; up to 167 dB using 23 dBi integrated antenna[2]
	Connectorized: Varies with modulation mode and antenna type[2]
Receiver sensitivity	Adaptive, varying between -94 dBm and -69 dBm
Modulation	Dynamic; adapting between BPSK and 64 QAM
Error correction	FEC
Duplex scheme	Symmetric Fixed TDD; same or split frequency Tx/Rx where regulations permit
Antenna	Integrated: Integrated flat plate 23 dBi / 8°
	Connectorized: Can operate with a selection of separately-purchased single and dual polar antennas through 2 x N-type female connectors (check local regulations prior to purchase)
Range	Up to 155 miles (250 km); up to 6 miles (10 km) in the optional LOS mode
Security and encryption	Proprietary scrambling mechanism; optional FIPS-197 compliant 128-bit and 256-bit AES Encryption

ETHERNET BRIDGING & T1/E1	
Protocol	IEEE 802.3
User data throughput	Standard–Dynamically variable up to 25 Mbps at the Ethernet (aggregate): 5 MHz Channel – Up to 13 Mbps 10 MHz Channel – Up to 25 Mbps 15 MHz Channel – Up to 25 Mbps (Upgradable to a PTP 500; requires a license-key purchase)
	LOS Mode–Dynamically variable up to 50 Mbps at the Ethernet (aggregate): 5 MHz Channel – Up to 18 Mbps 10 MHz Channel – Up to 35 Mbps 15 MHz Channel – Up to 50 Mbps (Optional, requires a license-key purchase)
Latency	<3 ms average each direction
QoS	802.1p (4 levels)
Interface	10 / 100 Base T (RJ-45) – auto MDI/MDIX
T1/E1 interface	Single T1/E1 port (with splitter cable); G703/G704, G823/G824

MANAGEMENT & INSTALLATION	
LED indicators	Power status, Ethernet link status and activity
System management	Web or SNMP v1/v2c/v3 using MIBII and a proprietary PTP MIB; Motorola Wireless Manager, version 2.2 or higher
Installation	Built-in audio and graphical assistance, plus voltage output for link optimization
Connection	Distance between outdoor unit and primary network connection: up to 330 ft. (100 meters)
Lightning protection	Built into the Outdoor Unit (ODU); an external PTP Lightning Protection Unit (PTP-LPU) end device is required near the base of the tower or wall at the cable entrance point leading to the network to protect the indoor LAN equipment

PHYSICAL	
Dimensions	Integrated ODU: Width 14.5" (370 mm), Height 14.5" (370 mm), Depth 3.75" (95 mm)
	Connectorized ODU: Width 12.2" (309 mm), Height 12.2" (309 mm), Depth 4.1" (105 mm)
	Powered Indoor Unit (PIDU Plus): Width 9.75" (250 mm), Height 1.5" (40 mm), Depth 3" (80 mm)
Weight	Integrated ODU: 11.8 lbs (5.35 kg) including bracket
	Connectorized ODU: 10.4 lbs (4.7 kg) including bracket PIDU Plus: 1.9 lbs (864 g)
Wind speed survival	202 mph (325 kph)
Power supply	Integrated with Indoor Unit
Power source	90–240 VAC, 50–60 Hz / 36-60V DC; redundant powering configurations supported
Power consumption	50 W max

ENVIRONMENTAL & REGULATORY	
Operating temperature	-40°F (-40°C) to +140°F (+60°C), including solar radiation
Protection and safety	UL60950-1; IEC60950-1; EN60950-1; CSA-C22.2 No. 60950-1
Radio	5.8 GHz: USA CFR 47 Part 15.247 Canada IC RSS-210 Issue 7 Europe EN 302 502, Eire Comreg 06/47R, UK IR2007
	5.4 GHz: USA CFR47 Part 15.407 Europe EN 301 893, Canada IC RSS-210 Issue 7
EMC	USA CFR 47 Part 15 Class B Canada CSA Std C108.8 1993 Class B Europe EN 55022 CISPR 22, Europe EN 301 489 - 1/4

[1] Regulatory conditions for RF bands may vary by geographic location and should be confirmed prior to system purchase.

[2] Gain, maximum transmit power and effective radiated power may vary based on regulatory domain.

MOTOROLA

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Point-to-Multipoint 54430

The PMP 54430 equipment offers customers speeds of up to 35Mb, allowing them to enjoy reliable use of all internet services including data transfer, voice and video applications such as iPlayer, HD and Skype.

Access Point

Typically four Point-to-Multipoint (PMP) 54430 antennas are installed at access points to provide a coverage of 360 degrees. Each access point covers up to a 5 mile radius depending on the topography.

The antenna provides wireless line-of-sight (LOS) and near line-of-sight (nLOS) broadband connectivity in the 5.4 GHz spectrum.

Subscriber Module

A Subscriber Module (SM) is the receiving antenna allpay Broadband installs at homes or businesses to receive the wireless radio signal from an access point.

FEATURE	INTEGRATED AP SPECIFICATION	SM SPECIFICATION
	CAP 54430	CSM 54430
MODULATION LEVELS (ADAPTIVE)	1X=QPSK, 2X=16QAM, 3X=64QAM	
FORWARD ERROR CORRECTION	¾ Reed-Solomon block coding	
PHYSICAL LAYER	OFDM 256FFT	
MAC (MEDIA ACCESS CONTROL) LAYER	Motorola Proprietary	
CYCLIC PREFIX	1/4, 1/8 or 1/16 fixed	
PPS	15,000	4,800
GPS SYNCHRONIZATION	Yes	
# OF SUBSCRIBERS PER SECTOR	Up to 200	N/A
ARQ	Yes	
QUALITY OF SERVICE	DiffServ QoS	
MAXIMUM DEPLOYMENT RANGE (W/ REFLECTOR DISH ON SM, LOS)	1X: 8 mi. (13 km), 2X: 6 mi. (10 km), 3X: 2.7 mi. (4 km)	
MAXIMUM AGGREGATE (UP+DOWN) THROUGHPUT PER SECTOR (@5 MHZ CHANNEL)	1X: 3.5 Mbps, 2X: 7 Mbps, 3X: 10.5 Mbps	
MAXIMUM AGGREGATE (UP+DOWN) THROUGHPUT PER SECTOR (@10MHZ CHANNEL)	1X: 8 Mbps, 2X: 16.5Mbps, 3X: 24.5Mbps	
MAXIMUM AGGREGATE (UP+DOWN) THROUGHPUT PER SECTOR (@20MHZ CHANNEL)	1X: 16.5 Mbps, 2X: 32 Mbps, 3X: >45 Mbps	
LATENCY	5-7 ms round trip	
ENCRYPTION	DES, FIPS 197 Certified AES Option	
NOMINAL RECEIVE SENSITIVITY (W/ FEC) @ 5 MHz CHANNEL	1X: -93 dBm, 2X: -86 dBm, 3X: -79 dBm	
NOMINAL RECEIVE SENSITIVITY (W/ FEC) @ 10MHZ CHANNEL	1X: -90 dBm, 2X: -83 dBm, 3X: -76 dBm	
NOMINAL RECEIVE SENSITIVITY (W/ FEC) @ 20MHZ CHANNEL	1X: -87 dBm, 2X: -80 dBm, 3X: -73 dBm	
ETHERNET INTERFACE	10/100BaseT, half/full duplex, rate auto negotiated (802.3 compliant)	
PROTOCOLS USED	IPv4, UDP, TCP, IP, ICMP, Telnet, SNMP, HTTP, FTP	
NETWORK MANAGEMENT	HTTP, Telnet, FTP, SNMPv2c Prizm 3.3 and One Point Wireless Manager 2.2	
VLAN	802.1ad (DVLAN Q-in-Q), 802.1Q with 802.1p priority, dynamic port VID	
CE	EN 301 893 v1.5.1	
TEMPERATURE	-40°C to +55°C (-40°F to +131°F) 0% – 95% relative humidity, non-condensing	
WIND SURVIVAL	190 km/hour (118 mi/hour)	190 km/hour (118 mi/hour)
WIND LOADING	90 lbs.	45 lbs.
DIMENSIONS (H X W X D)	71 x 21 x 28 cm (28.75" x 8.25" x 11")	30 x 9 x 9 cm (11.75" x 3.4" x 3.4")
WEIGHT	6.1 kg (13.5 lbs.) (w/ antenna) 2.8 kg (6.1 lbs.) (w/o antenna)	0.45kg (1 lb.)
MAX POWER CONSUMPTION	19W	10W
INPUT VOLTAGE	24 to 59 V	24 to 30 V
COLLOCATION WITH PMP 52100	Yes	
COLLOCATION WITH PMP 54100	Yes, 10MHz guard band separation or 5MHz with 3 ft vertical required; synchronization required	
COLLOCATION WITH PMP 54400	Interoperable when using 10 MHz channel and ¼ cyclic prefix	
COLLOCATION WITH PMP 58100	Yes	

Health & Safety Concerns...

There are no known health problems related to the equipment needed to set up wireless broadband services. If you would like to read more information about radio frequencies emitted by Wireless LAN equipment please visit the below websites:

World Health Organisation - EMF Project
www.who.int

National Radiological Protection Board (NRPB)
www.hpa.org.uk/radiation

Institute of Electrical and Electronics Engineers
www.ieee.org

International Radiation Protection Association
www.irpa.net

National Council on Radiation Protection and Measurements
www.ncrp.com

Radiocommunications Agency
www.ofcom.org.uk

Wireless LAN Association
www.wlana.org

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Why not follow us on Twitter or like us on Facebook?
Simply search allpay Broadband. We will keep you up to date with the latest news as it happens, including updates on our new broadband coverage areas.

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